by my brother's theory, published in the 'Proceedings' for May 1857.

I believe the theory I have given above contains the true explanation of one remarkable fact observed by Dr. Tyndall in connexion with the beautiful set of phenomena which he discovered to be produced by radiant heat, concentrated on an internal portion of a mass of clear ice by a lens; the fact, namely, that the planes in which the vesicles extend are generally parallel to the sides when the mass of ice operated on is a flat slab; for the solid will yield to the "negative" internal pressure due to the contractility of the melting ice, most easily in the direction perpendicular to the sides. The so-called negative pressure is therefore least, or which is the same thing, the positive pressure is greatest in this direction. Hence the vesicles of melted ice, or of vapour caused by the contraction of melted ice, must, as I have shown, tend to place themselves parallel to the sides of the slab.

The divisions of the vesicular layers into leaves like six-petaled flowers is a phenomenon which does not seem to me as yet so easily explained; but I cannot see that any of the phenomena described by Dr. Tyndall can be considered as having been proved to be due to ice having mechanical properties of a uniaxal crystal.

April 29, 1858.

J. P. GASSIOT, Esq., Vice-President, in the Chair.

The following communications were read :—

I. "An Account of the Weather in various localities during the 15th of March, 1858 (the day of the Great Solar Eclipse); together with Observations of the Effect produced by the Diminution of Light upon the Animal and Vegetable Kingdoms." By Edward Joseph Lowe, Esq., F.R.A.S., F.G.S., F.L.S., F.Z.S. &c. Communicated by Thomas Bell, Esq., P.L.S. Received April 1, 1858.

[Abstract.]

By the author's request, observations were made at 9 A.M., 11 A.M., and from noon every fifteen minutes up to $2^h\ 16^m$, at 3 P.M.,

4 P.M., 5 P.M., and 9 P.M., and these observations, consisting of the "Temperature in shade," "Wet-Bulb Thermometer in shade," "Temperature on grass in sunshine," "Temperature in sunshine," "Amount of cloud and direction of wind," have been arranged in Tables according to their distance from the annular path. The observations were made at the following stations;—

Somerton, Towcester, Isham, Peakirk, on the central line; Teignmouth, Little Bridy, and Bicester, within 10 miles of the central line; Exeter, Gloucester, Grantham, and Belvoir Castle, within 25 miles; Truro, Guernsey, Helston, Aldershott, Berkhampstead, Hereford, Royston, Norwich, and Highfield House, within 50 miles; London, Tottenham, Ventnor, and Southampton, within 75 miles; Uckfield, Leeds, Scarborough, Wakefield, Hawarden, Old Trafford, and Chorlton, within 100 miles; and Hastings, Fairlight, Lampeter, North Shields, Silloth, Liverpool, Stonyhurst, Durham, Edinburgh, Culloden, Isle of Man, Aberdeen, Orkney, Armagh, Belfast, Utrecht, and Vienna, above 100 miles from the central line. Readings of the barometer and extra remarks are appended at the close of the Tables.

The differences between the sun-thermometers in the air and on the grass are not so marked as might be expected, for it happens that in March and October their readings nearly approach each other. In winter the temperature in sunshine on the grass is considerably below that in the air, whilst in summer this condition is reversed. The dry-bulb thermometer fell at the middle of the eclipse from 2 to 4 degrees, the average being about $2\frac{1}{4}$ degrees; to this, however, must be added an extra amount, on account of the time of day at which the eclipse took place; had there been no eclipse, the temperature would necessarily have risen. The wet-bulb thermometer did not fall quite so much, as the air became more charged with water at the centre of the eclipse, the result of the phenomenon. Thermometers in sunshine (even where overcast) fell twice as much as those in shade.

At the majority of stations the early morning was exceedingly fine, and the sky almost free of clouds, yet before the eclipse commenced the sky became overcast and continued so. It seemed quite evident that the clouds were formed *in situ*. Durham, Edinburgh, Scarborough, Uckfield, London, Norwich, Southampton, Royston, Leicester, Belvoir Castle, Little Bridy, Isham, and Guernsey, were all places in which the weather previous to the eclipse had been more

or less free of clouds, and yet all were enveloped by cloud before noon.

The following features were very apparent :—The wind, although brisk before and during the progress of the eclipse, considerably moderated at the time of greatest obscuration, becoming brisk again afterwards. The darkness, although *felt*, was by no means so great as had been expected ; yet this was in a great measure owing to the overcast sky. The pupil of the eye was not contracted by strong light, consequently it was able to take in the diminished light over a larger surface, diminishing the effect of darkness to our senses. Practically it was dark ; the impossibility of reading the instruments at Isham, Towcester, and Grantham, was a certain measure. I have seen greater apparent darkness produced by a storm, and yet the darkness was not such as to prevent instruments being read. The contracted landscape was well shown at Isham and Highfield House. The change in the colour of the landscape was almost universally remarked, as well as the great stillness at the time of greatest obscuration. A solar halo occurred in the Orkney Islands during the time of greatest obscuration. Rooks everywhere returned to their rookeries ; fowls prepared to go to roost ; peafowl actually went to roost ; turkies hastened home ; cocks crowed ; sparrows appeared frightened ; songbirds sang as in early morning, and kept up their song all afternoon. Bees returned to their hives. Cows seemed to have imagined that milking-time had arrived. The crocus and hepatica closed their flowers. An effect on sea animals was not observable ; the *Actinia crassicornis*, which always expands in the evening, did not open during the eclipse.

II. "On the Structure and Functions of the Hairs of the Crustacea." By Campbell De Morgan, Esq. Communicated by George Busk, Esq. Received March 13, 1858.

(Abstract.)

The object of this communication is to determine, by the observation of their anatomical relations, the uses of the hairs and similar appendages to the shell of the Crustacea. The author mentions the observations of those who have of late specially investigated this subject. M. Lavalle noticed the connexion at times of the canals of the